FIG. 1

INPUT SIGNAL Sc → 6 FRAMING → Scf

7 ADDITIVE NOISE REDUCTION

8 FEATURE VECTOR GENERATION → $[c_{i,M}]'$

9 MULTIPLICATIVE NOISE REDUCTION → $[c_{i,M}]$

10 PATH SEARCH → D_V

DESIGNATED TEXT → T_X → 300 STANDARD ACOUSTIC MODEL (STANDARD VOICE HMM) → $[a_{n,M}]$

11 SPEAKER ADAPTATION → $[x_{n,M}]$

12 FEATURE VECTOR GENERATION → $[s_{i,M}]$

400 SPEAKER ADAPTIVE ACCOUSTIC MODEL (ADAPTIVE VOICE HMM)

13 ADDITIVE NOISE REDUCTION

14 FEATURE VECTOR GENERATION → $[y_{i,M}]'$

15 MULTIPLICATIVE NOISE REDUCTION → $[y_{i,M}]$
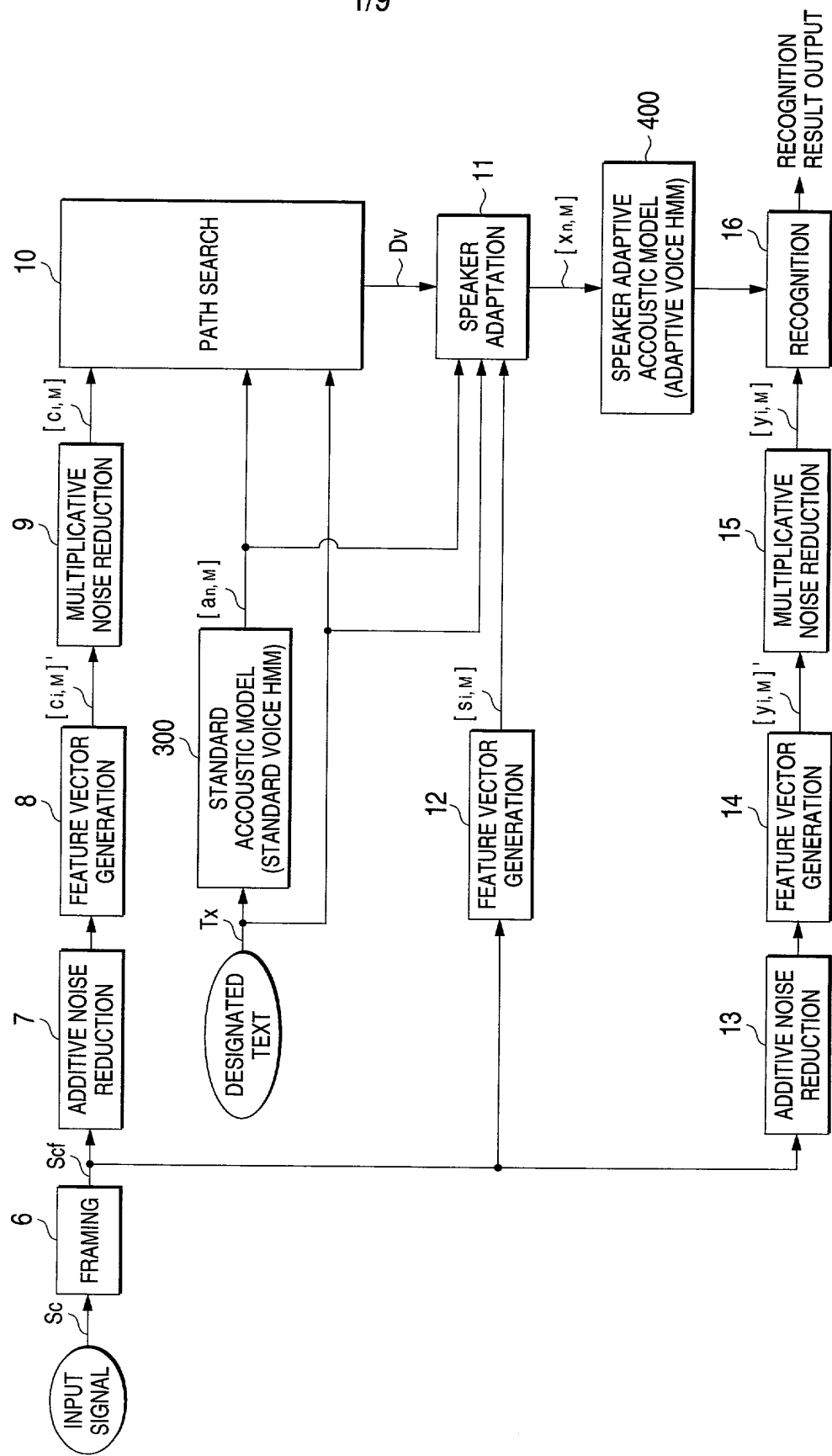
16 RECOGNITION → RECOGNITION RESULT OUTPUT

FIG. 2

STATE NUMBER n	SYLLABLE	STANDARD VECTOR $[a_{n,M}]$				
1	A	$[\ a_{1,1}$	$a_{1,2}$	$a_{1,3}$	$\cdots\cdots$	$a_{1,M}\ ]$
2	I	$[\ a_{2,1}$	$a_{2,2}$	$a_{2,3}$	$\cdots\cdots$	$a_{2,M}\ ]$
3	U	$[\ a_{3,1}$	$a_{3,2}$	$a_{3,3}$	$\cdots\cdots$	$a_{3,M}\ ]$
4	E	$[\ a_{4,1}$	$a_{4,2}$	$a_{4,3}$	$\cdots\cdots$	$a_{4,M}\ ]$
5	O	$[\ a_{5,1}$	$a_{5,2}$	$a_{5,3}$	$\cdots\cdots$	$a_{5,M}\ ]$
6	KA	$[\ a_{6,1}$	$a_{6,2}$	$a_{6,3}$	$\cdots\cdots$	$a_{6,M}\ ]$
⋮	⋮			⋮		
10	KO	$[\ a_{10,1}$	$a_{10,2}$	$a_{10,3}$	$\cdots\cdots$	$a_{10,M}\ ]$
11	SA	$[\ a_{11,1}$	$a_{11,2}$	$a_{11,3}$	$\cdots\cdots$	$a_{11,M}\ ]$
⋮	⋮			⋮		
16	TA	$[\ a_{16,1}$	$a_{16,2}$	$a_{16,3}$	$\cdots\cdots$	$a_{16,M}\ ]$
17	TI	$[\ a_{17,1}$	$a_{17,2}$	$a_{17,3}$	$\cdots\cdots$	$a_{17,M}\ ]$
⋮	⋮			⋮		
21	NA	$[\ a_{21,1}$	$a_{21,2}$	$a_{21,3}$	$\cdots\cdots$	$a_{21,M}\ ]$
22	NI	$[\ a_{22,1}$	$a_{22,2}$	$a_{22,3}$	$\cdots\cdots$	$a_{22,M}\ ]$
⋮	⋮			⋮		
26	HA	$[\ a_{26,1}$	$a_{26,2}$	$a_{26,3}$	$\cdots\cdots$	$a_{26,M}\ ]$
⋮	⋮			⋮		
31	MA	$[\ a_{31,1}$	$a_{31,2}$	$a_{31,3}$	$\cdots\cdots$	$a_{31,M}\ ]$
⋮	⋮			⋮		
36	YA	$[\ a_{36,1}$	$a_{36,2}$	$a_{36,3}$	$\cdots\cdots$	$a_{36,M}\ ]$
37	YU	$[\ a_{37,1}$	$a_{37,2}$	$a_{37,3}$	$\cdots\cdots$	$a_{37,M}\ ]$
38	YO	$[\ a_{38,1}$	$a_{38,2}$	$a_{38,3}$	$\cdots\cdots$	$a_{38,M}\ ]$
39	RA	$[\ a_{39,1}$	$a_{39,2}$	$a_{39,3}$	$\cdots\cdots$	$a_{39,M}\ ]$
⋮	⋮			⋮		
44	WA	$[\ a_{44,1}$	$a_{44,2}$	$a_{44,3}$	$\cdots\cdots$	$a_{44,M}\ ]$
45	WO	$[\ a_{45,1}$	$a_{45,2}$	$a_{45,3}$	$\cdots\cdots$	$a_{45,M}\ ]$
46	N	$[\ a_{46,1}$	$a_{46,2}$	$a_{46,3}$	$\cdots\cdots$	$a_{46,M}\ ]$
⋮	⋮			⋮		
N	⋮	$[\ a_{N,1}$	$a_{N,2}$	$a_{N,3}$	$\cdots\cdots$	$a_{N,M}\ ]$

FIG. 3

TIME →

FRAME NUMBER i	AT THE TIME OF SPEAKER ADAPTATION, FEATURE VECTOR $[s_{i,M}]$ GENERATED IN THE FEATURE VECTOR GENERATION SECTION 12				
1	$[\ s_{1,1}$	$s_{1,2}$	$s_{1,3}$	$\cdots\cdots$	$s_{1,M}\ ]$
2	$[\ s_{2,1}$	$s_{2,2}$	$s_{2,3}$	$\cdots\cdots$	$s_{2,M}\ ]$
3	$[\ s_{3,1}$	$s_{3,2}$	$s_{3,3}$	$\cdots\cdots$	$s_{3,M}\ ]$
4	$[\ s_{4,1}$	$s_{4,2}$	$s_{4,3}$	$\cdots\cdots$	$s_{4,M}\ ]$
5	$[\ s_{5,1}$	$s_{5,2}$	$s_{5,3}$	$\cdots\cdots$	$s_{5,M}\ ]$
6	$[\ s_{6,1}$	$s_{6,2}$	$s_{6,3}$	$\cdots\cdots$	$s_{6,M}\ ]$
7	$[\ s_{7,1}$	$s_{7,2}$	$s_{7,3}$	$\cdots\cdots$	$s_{7,M}\ ]$
8	$[\ s_{8,1}$	$s_{8,2}$	$s_{8,3}$	$\cdots\cdots$	$s_{8,M}\ ]$
9	$[\ s_{9,1}$	$s_{9,2}$	$s_{9,3}$	$\cdots\cdots$	$s_{9,M}\ ]$
10	$[\ s_{10,1}$	$s_{10,2}$	$s_{10,3}$	$\cdots\cdots$	$s_{10,M}\ ]$
11	$[\ s_{11,1}$	$s_{11,2}$	$s_{11,3}$	$\cdots\cdots$	$s_{11,M}\ ]$
12	$[\ s_{12,1}$	$s_{12,2}$	$s_{12,3}$	$\cdots\cdots$	$s_{12,M}\ ]$
13	$[\ s_{13,1}$	$s_{13,2}$	$s_{13,3}$	$\cdots\cdots$	$s_{13,M}\ ]$
14	$[\ s_{14,1}$	$s_{14,2}$	$s_{14,3}$	$\cdots\cdots$	$s_{14,M}\ ]$
15	$[\ s_{15,1}$	$s_{15,2}$	$s_{15,3}$	$\cdots\cdots$	$s_{15,M}\ ]$
16	$[\ s_{16,1}$	$s_{16,2}$	$s_{16,3}$	$\cdots\cdots$	$s_{16,M}\ ]$
17	$[\ s_{17,1}$	$s_{17,2}$	$s_{17,3}$	$\cdots\cdots$	$s_{17,M}\ ]$
18	$[\ s_{18,1}$	$s_{18,2}$	$s_{18,3}$	$\cdots\cdots$	$s_{18,M}\ ]$
19	$[\ s_{19,1}$	$s_{19,2}$	$s_{19,3}$	$\cdots\cdots$	$s_{19,M}\ ]$
20	$[\ s_{20,1}$	$s_{20,2}$	$s_{20,3}$	$\cdots\cdots$	$s_{20,M}\ ]$
$\vdots$		$\vdots$			
29	$[\ s_{29,1}$	$s_{29,2}$	$s_{29,3}$	$\cdots\cdots$	$s_{29,M}\ ]$
30	$[\ s_{30,1}$	$s_{30,2}$	$s_{30,3}$	$\cdots\cdots$	$s_{30,M}\ ]$

FIG. 4

TIME ↓

FRAME NUMBER i	AT THE TIME OF SPEAKER ADAPTATION, FEATURE VECTOR [$c_{i, M}$] OUTPUTTED FROM MULTIPLICATIVE NOISE REMOVAL SECTION 9				
1	[$c_{1, 1}$	$c_{1, 2}$	$c_{1, 3}$	⋯⋯	$c_{1, M}$]
2	[$c_{2, 1}$	$c_{2, 2}$	$c_{2, 3}$	⋯⋯	$c_{2, M}$]
3	[$c_{3, 1}$	$c_{3, 2}$	$c_{3, 3}$	⋯⋯	$c_{3, M}$]
4	[$c_{4, 1}$	$c_{4, 2}$	$c_{4, 3}$	⋯⋯	$c_{4, M}$]
5	[$c_{5, 1}$	$c_{5, 2}$	$c_{5, 3}$	⋯⋯	$c_{5, M}$]
6	[$c_{6, 1}$	$c_{6, 2}$	$c_{6, 3}$	⋯⋯	$c_{6, M}$]
7	[$c_{7, 1}$	$c_{7, 2}$	$c_{7, 3}$	⋯⋯	$c_{7, M}$]
8	[$c_{8, 1}$	$c_{8, 2}$	$c_{8, 3}$	⋯⋯	$c_{8, M}$]
9	[$c_{9, 1}$	$c_{9, 2}$	$c_{9, 3}$	⋯⋯	$c_{9, M}$]
10	[$c_{10, 1}$	$c_{10, 2}$	$c_{10, 3}$	⋯⋯	$c_{10, M}$]
11	[$c_{11, 1}$	$c_{11, 2}$	$c_{11, 3}$	⋯⋯	$c_{11, M}$]
12	[$c_{12, 1}$	$c_{12, 2}$	$c_{12, 3}$	⋯⋯	$c_{12, M}$]
13	[$c_{13, 1}$	$c_{13, 2}$	$c_{13, 3}$	⋯⋯	$c_{13, M}$]
14	[$c_{14, 1}$	$c_{14, 2}$	$c_{14, 3}$	⋯⋯	$c_{14, M}$]
15	[$c_{15, 1}$	$c_{15, 2}$	$c_{15, 3}$	⋯⋯	$c_{15, M}$]
16	[$c_{16, 1}$	$c_{16, 2}$	$c_{16, 3}$	⋯⋯	$c_{16, M}$]
17	[$c_{17, 1}$	$c_{17, 2}$	$c_{17, 3}$	⋯⋯	$c_{17, M}$]
18	[$c_{18, 1}$	$c_{18, 2}$	$c_{18, 3}$	⋯⋯	$c_{18, M}$]
19	[$c_{19, 1}$	$c_{19, 2}$	$c_{19, 3}$	⋯⋯	$c_{19, M}$]
20	[$c_{20, 1}$	$c_{20, 2}$	$c_{20, 3}$	⋯⋯	$c_{20, M}$]
⋮		⋮			
29	[$c_{29, 1}$	$c_{29, 2}$	$c_{29, 3}$	⋯⋯	$c_{29, M}$]
30	[$c_{30, 1}$	$c_{30, 2}$	$c_{30, 3}$	⋯⋯	$c_{30, M}$]

FIG. 5

FRAME NUMBER i	STATE NUMBER n	
1	10	
2	10	
3	10	[KO]
4	10	
5	10	
6	10	
7	46	
8	46	[N]
9	46	
10	46	
11	22	
12	22	[N1]
13	22	
14	22	
15	17	
16	17	[T1]
17	17	
18	17	
19	44	
20	44	
⋮	⋮	[WA]
29	44	
30	44	

TIME ↓

FIG. 6

FRAME NUMBER i	FEATURE VECTOR $[s_{i,M}]$	STATE NUMBER n	STANDARD VECTOR $[a_{n,M}]$	
1	$[\ s_{1,1}\ \cdots\cdots\ s_{1,M}\ ]$	10	$[\ a_{10,1}\ \cdots\cdots\ a_{10,M}\ ]$	
2	$[\ s_{2,1}\ \cdots\cdots\ s_{2,M}\ ]$	10	$[\ a_{10,1}\ \cdots\cdots\ a_{10,M}\ ]$	
3	$[\ s_{3,1}\ \cdots\cdots\ s_{3,M}\ ]$	10	$[\ a_{10,1}\ \cdots\cdots\ a_{10,M}\ ]$	
4	$[\ s_{4,1}\ \cdots\cdots\ s_{4,M}\ ]$	10	$[\ a_{10,1}\ \cdots\cdots\ a_{10,M}\ ]$	[KO]
5	$[\ s_{5,1}\ \cdots\cdots\ s_{5,M}\ ]$	10	$[\ a_{10,1}\ \cdots\cdots\ a_{10,M}\ ]$	
6	$[\ s_{6,1}\ \cdots\cdots\ s_{6,M}\ ]$	10	$[\ a_{10,1}\ \cdots\cdots\ a_{10,M}\ ]$	
7	$[\ s_{7,1}\ \cdots\cdots\ s_{7,M}\ ]$	46	$[\ a_{46,1}\ \cdots\cdots\ a_{46,M}\ ]$	
8	$[\ s_{8,1}\ \cdots\cdots\ s_{8,M}\ ]$	46	$[\ a_{46,1}\ \cdots\cdots\ a_{46,M}\ ]$	[N]
9	$[\ s_{9,1}\ \cdots\cdots\ s_{9,M}\ ]$	46	$[\ a_{46,1}\ \cdots\cdots\ a_{46,M}\ ]$	
10	$[\ s_{10,1}\ \cdots\cdots\ s_{10,M}\ ]$	46	$[\ a_{46,1}\ \cdots\cdots\ a_{46,M}\ ]$	
11	$[\ s_{11,1}\ \cdots\cdots\ s_{11,M}\ ]$	22	$[\ a_{22,1}\ \cdots\cdots\ a_{22,M}\ ]$	
12	$[\ s_{12,1}\ \cdots\cdots\ s_{12,M}\ ]$	22	$[\ a_{22,1}\ \cdots\cdots\ a_{22,M}\ ]$	[NI]
13	$[\ s_{13,1}\ \cdots\cdots\ s_{13,M}\ ]$	22	$[\ a_{22,1}\ \cdots\cdots\ a_{22,M}\ ]$	
14	$[\ s_{14,1}\ \cdots\cdots\ s_{14,M}\ ]$	22	$[\ a_{22,1}\ \cdots\cdots\ a_{22,M}\ ]$	
15	$[\ s_{15,1}\ \cdots\cdots\ s_{15,M}\ ]$	17	$[\ a_{17,1}\ \cdots\cdots\ a_{17,M}\ ]$	
16	$[\ s_{16,1}\ \cdots\cdots\ s_{16,M}\ ]$	17	$[\ a_{17,1}\ \cdots\cdots\ a_{17,M}\ ]$	[TI]
17	$[\ s_{17,1}\ \cdots\cdots\ s_{17,M}\ ]$	17	$[\ a_{17,1}\ \cdots\cdots\ a_{17,M}\ ]$	
18	$[\ s_{18,1}\ \cdots\cdots\ s_{18,M}\ ]$	17	$[\ a_{17,1}\ \cdots\cdots\ a_{17,M}\ ]$	
19	$[\ s_{19,1}\ \cdots\cdots\ s_{19,M}\ ]$	44	$[\ a_{44,1}\ \cdots\cdots\ a_{44,M}\ ]$	
20	$[\ s_{20,1}\ \cdots\cdots\ s_{20,M}\ ]$	44	$[\ a_{44,1}\ \cdots\cdots\ a_{44,M}\ ]$	
⋮	⋮	⋮	⋮	[WA]
29	$[\ s_{29,1}\ \cdots\cdots\ s_{29,M}\ ]$	44	$[\ a_{44,1}\ \cdots\cdots\ a_{44,M}\ ]$	
30	$[\ s_{30,1}\ \cdots\cdots\ s_{30,M}\ ]$	44	$[\ a_{44,1}\ \cdots\cdots\ a_{44,M}\ ]$	

FIG. 7

	AVERAGE FEATURE VECTOR $[s_{n,M}]$	STATE NUMBER n	STANDARD VECTOR $[a_{n,M}]$	
AVERAGE OF $i = 1 \sim 6$	$[s_{10,1} \cdots\cdots s_{10,M}]$	10	$[a_{10,1} \cdots\cdots a_{10,M}]$	→ [KO]
AVERAGE OF $i = 7 \sim 10$	$[s_{46,1} \cdots\cdots s_{46,M}]$	46	$[a_{46,1} \cdots\cdots a_{46,M}]$	→ [N]
AVERAGE OF $i = 11 \sim 14$	$[s_{22,1} \cdots\cdots s_{22,M}]$	22	$[a_{22,1} \cdots\cdots a_{22,M}]$	→ [NI]
AVERAGE OF $i = 15 \sim 18$	$[s_{17,1} \cdots\cdots s_{17,M}]$	17	$[a_{17,1} \cdots\cdots a_{17,M}]$	→ [TI]
AVERAGE OF $i = 19 \sim 30$	$[s_{44,1} \cdots\cdots s_{44,M}]$	44	$[a_{44,1} \cdots\cdots a_{44,M}]$	→ [WA]

FIG. 8

STATE NUMBER n	SYLLABLE	ADAPTIVR VECTOR OF ACCOUSTIC HMM AFTER UPDATED				
1	A	[$X_{1,1}$	$X_{1,2}$	$X_{1,3}$	······	$X_{1,M}$]
2	I	[$X_{2,1}$	$X_{2,2}$	$X_{2,3}$	······	$X_{2,M}$]
3	U	[$X_{3,1}$	$X_{3,2}$	$X_{3,3}$	······	$X_{3,M}$]
4	E	[$X_{4,1}$	$X_{4,2}$	$X_{4,3}$	······	$X_{4,M}$]
5	O	[$X_{5,1}$	$X_{5,2}$	$X_{5,3}$	······	$X_{5,M}$]
6	KA	[$X_{6,1}$	$X_{6,2}$	$X_{6,3}$	······	$X_{6,M}$]
⋮	⋮			⋮		
10	KO	[$X_{10,1}$	$X_{10,2}$	$X_{10,3}$	······	$X_{10,M}$]
11	SA	[$X_{11,1}$	$X_{11,2}$	$X_{11,3}$	······	$X_{11,M}$]
⋮	⋮			⋮		
16	TA	[$X_{16,1}$	$X_{16,2}$	$X_{16,3}$	······	$X_{16,M}$]
17	TI	[$X_{17,1}$	$X_{17,2}$	$X_{17,3}$	······	$X_{17,M}$]
⋮	⋮			⋮		
21	NA	[$X_{21,1}$	$X_{21,2}$	$X_{21,3}$	······	$X_{21,M}$]
22	NI	[$X_{22,1}$	$X_{22,2}$	$X_{22,3}$	······	$X_{22,M}$]
⋮	⋮			⋮		
26	HA	[$X_{26,1}$	$X_{26,2}$	$X_{26,3}$	······	$X_{26,M}$]
⋮	⋮			⋮		
31	MA	[$X_{31,1}$	$X_{31,2}$	$X_{31,3}$	······	$X_{31,M}$]
⋮	⋮			⋮		
36	YA	[$X_{36,1}$	$X_{36,2}$	$X_{36,3}$	······	$X_{36,M}$]
37	YU	[$X_{37,1}$	$X_{37,2}$	$X_{37,3}$	······	$X_{37,M}$]
38	YO	[$X_{38,1}$	$X_{38,2}$	$X_{38,3}$	······	$X_{38,M}$]
39	RA	[$X_{39,1}$	$X_{39,2}$	$X_{39,3}$	······	$X_{39,M}$]
⋮	⋮			⋮		
44	WA	[$X_{44,1}$	$X_{44,2}$	$X_{44,3}$	······	$X_{44,M}$]
45	WO	[$X_{45,1}$	$X_{45,2}$	$X_{45,3}$	······	$X_{45,M}$]
46	N	[$X_{46,1}$	$X_{46,2}$	$X_{46,3}$	······	$X_{46,M}$]
⋮	⋮			⋮		
N	⋮	[$X_{N,1}$	$X_{N,2}$	$X_{N,3}$	······	$X_{N,M}$]

FIG. 9